

In the Claims:

1. (Currently Amended) A system for analysis of an in vivo biological sample, comprising:

a middle infrared radiation source configured to provide radiation in a spectral range of about 2.5 microns to about 20 microns;

an optical fiber operatively coupled to said middle infrared radiation source, said optical fiber being substantially transparent in said spectral range of about 2.5 microns to about 20 microns;

an unclad interchangeable fiberoptic probe associated with said optical fiber and configured to direct radiation from said radiation source to said in vivo biological sample, wherein said fiberoptic probe is configured to be in direct contact with said in vivo biological sample;

a detector operatively coupled to said optical fiber and configured to detect radiation reflected from said in vivo biological sample through said optical fiber; and

a Fourier transform infrared spectrophotometer operatively coupled to said detector and configured to detect radiation in said spectral range of about 2.5 microns to about 20 microns.

2. (Previously Presented) The system of claim 1, wherein said interchangeable fiberoptic probe is selected from the group consisting of a shaped probe, a needle probe, a diffusor probe, a microscope head probe, an endoscopic probe, and a catheter probe.

3. (Original) The system of claim 1, wherein said fiberoptic probe is configured for use as an in vivo percutaneous probe.

4. (Previously Presented) The system of claim 1, wherein said radiation has a spectral range of about 2.5 microns to about 12 microns.

5. (Original) The system of claim 1, wherein said fiberoptic probe is configured to operate in attenuated total reflectance mode.

6. (Currently Amended) A method for non-invasive analysis of an in vivo biological sample, comprising:

obtaining a first Fourier transform infrared spectrum of a normal in vivo biological sample using an unclad fiberoptic probe operating in an attenuated total reflection mode, wherein said unclad fiberoptic probe is configured to be in direct contact with said in vivo biological sample;

obtaining a second Fourier transform infrared spectrum of an abnormal in vivo biological sample using said unclad fiberoptic probe operating in said attenuated total reflection mode; and

comparing at least one selected absorption band in said first Fourier transform infrared spectrum to at least one selected absorption band in said second Fourier transform infrared spectrum.

7. (Original) The method of claim 6, wherein said comparing comprises comparing a peak position of said at least one selected absorption band in said first Fourier transform infrared spectrum to a peak position of said at least one selected absorption band in said second Fourier transform infrared spectrum.

8. (Previously Presented) The method of claim 6, wherein said comparing comprises comparing an area under a peak in said at least one selected absorption band in said first Fourier transform infrared spectrum to an area under a peak in said at least one selected absorption band in said second Fourier transform infrared spectrum.

9. (Original) The method of claim 6, wherein said comparing comprises comparing an intensity of a peak associated with said at least one selected absorption band in said first Fourier transform infrared spectrum to an intensity of a peak associated with said at least one selected absorption band in said second Fourier transform infrared spectrum.

10. (Original) The method of claim 9, wherein said comparing comprises determining an intensity ratio for said peak associated with said at least one selected absorption band in said first Fourier transform infrared spectrum and said peak associated with said at least one selected absorption band in said second Fourier transform infrared spectrum.